

REMARKS/ARGUMENTS

Reconsideration of this application in light of the above amendments and following comments is courteously solicited.

The invention as claimed in the amended claim 1 is directed to a method for producing a metal/ceramic bonding substrate wherein a metal member is bonded to at least one side of a ceramic substrate via an active metal containing brazing filler metal, the method comprising the steps of: bonding a metal member to at least one side of a ceramic substrate via an active metal containing brazing filler metal; applying a resist on a predetermined portion of a surface of the metal member to etch a part of the metal member, and removing the resist; etching a part of a metal layer, which is mainly formed of a metal other than an active metal of the active metal containing brazing filler metal, with a first chemical; and selectively etching a part of an active metal layer, which is formed of the active metal and a compound thereof, with a second chemical which inhibits the metal member and the metal layer from being etched and which selectively etch the active metal layer, to form a metal circuit on the ceramic substrate.

Thus, according to the inventions as claimed in the amended claim 1, it is possible to form a fillet on the peripheral portion of a metal circuit by a small number of steps to produce a reliable metal/ceramic bonding substrate at low costs, by etching the active metal layer of the active metal containing brazing filler metal while inhibiting excessive etching (side etching) of the metal layer, which is formed of the metal other than the active metal of the brazing filler metal, into the metal circuit by using the second chemical, which inhibits the metal circuit and the metal layer of the brazing filler metal from being etched and which selectively etch the active metal layer, when the active metal layer of the brazing filler metal

is removed after the part of the metal layer is etched with the first chemical.

In particular, in the method of the amended claim 1, the resist is removed from the metal member after the part of the metal member is etched. Therefore, the part of the brazing filler metal is etched after the resist is removed from the metal member, i.e., when the resist is not applied on the metal member, as clearly shown in FIGS. 3A and 3B.

In addition, in the method of the amended claim 1, the part of the brazing filler metal is etched at two etching steps which use different kinds of chemicals, respectively, as clearly shown in FIGS. 3A and 3B. That is, after the resist is removed from the metal member, the part of the metal layer, which is mainly formed of the metal other than the active metal of the active metal containing brazing filler metal, is etched with the first chemical as shown in FIG. 3A, and then, the part of the active metal layer, which is formed of the active metal and the compound thereof, is selectively etched with the second chemical which inhibits the metal member and the metal layer from being etched and which selectively etch the active metal layer as shown in FIG. 3B, the second chemical being different from the first chemical.

Claims 1 and 7-12 were rejected under 35 U.S.C. §102(e) as being anticipated by US 6,918,529 (Tsukaguchi).

Tsukaguchi (US 6,918,529) discloses a method for producing a metal/ceramic bonding circuit board comprising the steps of: bonding a metal plate of a metal to at least one side of a ceramic substrate via a brazing filler metal; applying a resist on a predetermined portion of a surface of the metal plate to etch and remove an undesired portion of the metal plate to form a metal circuit portion; and removing an undesired portion of the brazing filler metal and a reaction product, which is

produced by a reaction of the brazing filler metal with the ceramic substrate, while maintaining the resist, and thereafter, peeling off the resist to form a circuit pattern.

Tsukaguchi also discloses that chemicals for removing the brazing filler metal are preferably obtained from a chelating agent, aqueous hydrogen peroxide and a pH regulator. Moreover, Tsukaguchi discloses that the chelating agent is preferably EDTA and the pH regulator is preferably aqueous ammonia or an alkali hydroxide.

However, in the method of Tsukaguchi, the brazing filler metal is etched while the resist is applied on the metal plate as clearly shown in FIGS. 3A and 3B. Therefore, Tsukaguchi fails to disclose or suggest that the brazing filler metal is etched after the resist is removed from the metal member, i.e., when the resist is not applied on the metal member.

In addition, in the method of Tsukaguchi, the brazing filler metal is etched with chemicals at one etching step while the resist is applied on the metal plate. Therefore, Tsukaguchi also fails to disclose or suggest that the part of the brazing filler metal is etched at two etching steps which use different kinds of chemicals, respectively. That is, Tsukaguchi fails to disclose or suggest that, after the resist is removed from the metal member, the part of the metal layer, which is mainly formed of the metal other than the active metal of the active metal containing brazing filler metal, is etched with the first chemical, and then, the part of the active metal layer, which is formed of the active metal and the compound thereof, is selectively etched with the second chemical which inhibits the metal member and the metal layer from being etched and which selectively etch the active metal layer, the second chemical being different from the first chemical.

Claims 1 and 7-12 were rejected under 35 U.S.C. §102(e) as

being anticipated by US 6,613,450 (Tsukaguchi).

In the method of Tsukaguchi (US 6,613,450), the brazing filler metal is etched at one step when the resist is not applied on the metal plate as clearly shown in FIG. 3A. Therefore, Tsukaguchi fails to disclose or suggest that the part of the brazing filler metal is etched at two etching steps which use different kinds of chemicals, respectively. That is, Tsukaguchi fails to disclose or suggest that, after the resist is removed from the metal member, the part of the metal layer, which is mainly formed of the metal other than the active metal of the active metal containing brazing filler metal, is etched with the first chemical, and then, the part of the active metal layer, which is formed of the active metal and the compound thereof, is selectively etched with the second chemical which inhibits the metal member and the metal layer from being etched and which selectively etch the active metal layer, the second chemical being different from the first chemical.

Therefore, claims 1 and 7-12 are not anticipated by US 6,918,529 (Tsukaguchi) or US 6,613,450 (Tsukaguchi). Accordingly, it is believed that the amended claims patentably distinguish the invention from the prior art.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is submitted that the claims as amended herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

If any fees are required in connection with this case, it is respectfully requested that they be charged to Deposit Account No. 02-0184.

Respectfully submitted,

Junji Nakamura

By 

Gregory P. LaPointe
Attorney for Applicant
Reg. No. 28,395
Tel: (203) 777-6628
Fax: (203) 865-0297

Date: April 7, 2006

I, Rachel Piscitelli, hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313" on April 7, 2006.

